



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/425,694	10/22/99	BRUNNER	R BRUNNER-ET-A

COLLARD & ROE PC
1077 NORTHERN BLVD
ROSLYN NY 11576

IM62/1023

EXAMINER

BROWN, C

ART UNIT

PAPER NUMBER

1765

DATE MAILED: 10/23/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/425,694

Applicant(s)
Brunner et al.

Examiner
Charlotte A. Brown

Group Art Unit
1765



☒ Responsive to communication(s) filed on Jul 31, 2000

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-11 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-11 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☒ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☒ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

Art Unit: 1765

DETAILED ACTION

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pirooz et al. (EP 0701275).

From line 32 of column 2 to the end of column 3, Pirooz discloses a method for treating a silicon wafer which includes the step of contacting the surface of the silicon wafer with an aqueous solution containing hydrofluoric acid to remove the metals from the wafer surface. The removal is carried out by contacting the silicon wafers with an aqueous solution containing about 1:1 to 1:10,000 parts by volume HF:H₂O. To enhance the metals removal, the solution may additionally contain HCl, H₂O₂ OR O₃. The aqueous ozone solution, O₃, has a concentration from 0.1 ppm to 50 ppm. This treatment sequence is preceded by a SC-1 (standard clean 1) in which the semiconductor wafers are treated with a solution containing H₂O, H₂O₂, and NH₄OH. The solution may be at a temperature of about 10°C to about 90°C and the silicon wafers are immersed in a flowing bath of this solution for a period of at least about 0.1 minutes. The final step of the cleaning process is drying the oxidized wafers. The wafers may be dried using any method which does not recontaminate the wafers with metals or other contaminants. Such

Art Unit: 1765

methods include conventional spin drying and isopropyl alcohol vapor drying techniques which are well known in the field.

Unlike the claimed invention, Pirooz does not disclose a method for forming the treatment sequence B₂ by treating the semiconductor wafer with an aqueous O₃ solution and then treating the semiconductor wafers with a liquid selected from the group consisting of water and an aqueous HCl solution. Because Pirooz first treats the semiconductor wafer with an HF solution and then adds O₃, H₂O₂, or HCL, in water, it is the Examiner's position that a person having ordinary skill in the art would have found it obvious to modify Pirooz's procedure by treating the semiconductor wafers with O₃, and then treating the wafers with a liquid containing H₂O and HCL. This sequence of steps would have been anticipated to produce an expected result.

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. (EP 0731498A2)

Fukuzawa discloses a silicon substrate surface processing method comprising the steps of supplying an HF water solution and ozone water into a processing bath to create a mixture containing HF with a concentration of 0.01% to 1% and ozone water with a concentration of 0.1 ppm to 20 ppm.

Art Unit: 1765

4. Applicant's arguments filed July 31, 2000 have been fully considered but they are not persuasive.

In traversing the rejection based on Pirooz, the applicants' state that Pirooz does teaches away from the claimed invention by interrupting the treatment sequence by rinsing with water and another treatment liquid. This point is not understood since Pirooz discloses a method wherein semiconductors wafers are treated in separate steps with an HF, O₃, and HCl solution. The semiconductor wafers are rinsed with water and another treatment liquid before the ozone (O₃) treatment step is performed. The treatment steps are not interrupted by this procedure. The applicants have failed to explain how this procedure interrupts the treatment steps.

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

Art Unit: 1765

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication from the Examiner should be directed to Charlotte A. Brown whose telephone number is (703) 305-0727.

CAB

October 20 , 2000


BENJAMIN L. UTECH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700